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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/686,684 | 10/16/2003 | Scott P. Crafton | C152 1092.1 | 7662 |

7590 04/17/2006

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| EXAMINER |
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LIN, ING HOUR

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| ART UNIT | PAPER NUMBER |
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1725

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/686,684 | Applicant(s) CRAFTON ET AL. | |
| | Examiner Ing-Hour Lin | Art Unit 1725 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 67-80,82-88,103 and 104 is/are pending in the application.
- 4a) Of the above claim(s) 84-88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 67-80,82,83,103 and 104 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 67-80, 82-83 and 103-104, drawn to a method for processing a metal casting, classified in class 164, subclass 5.

II. Claims 84-88 drawn to an apparatus for processing a metal casting, classified in class 164, subclass 404.

2. The inventions are distinct, each from the other because of the following reasons:

Inventions Group I and Group II are related as process and apparatus for its practice.

The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e). In this case the casting process can be practiced by another materially different apparatus such as fluidized bed.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with attorney Dana Stano on February 2 , 2006 a provisional election was made without traverse to prosecute the invention of Group I, claims 67-80, 82-83 and 103-104. Affirmation of this election must be made by applicant in replying to

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this Office action. Claims 84-88 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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8. Claims 80 and 82-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crafton (US 5,439,045) in view of Kawai et al.

Crafton (US 5,439,045) (col. 3, lines 54+) teaches the use of preheating the mold containing cores and pouring molten metal into mold in the entrance zone 14 of a furnace 12 then performing heat treatment including combusting combustible binder of the core in the heated zone 16.

Crafton (US 5,439,045) fails to teach the use of forced cooling casting apparatus. However, Kawai et al (col. 3, lines 49+) teach the use of partially solidifying the casting using forced cooling casting apparatus including mold hole or mold access opening 13 and tubular member 16 for the purpose of coupling cooling nozzle 24 and effectively partially solidifying the casting and heat treating the casting within the mold. It would have been obvious to one having ordinary skill in the art to provide Crafton (US 5,439,045) the use of forced cooling casting apparatus as taught by Kawai et al in order to reduce casting defect and enhance the mechanical property of the casting.

9. Claims 67-73, 76-79 and 103-104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crafton (US 5,439,045) in view of Kawai et al and further in view of JP 08132220.

Crafton (US 5,439,045) in view of Kawai et al fails to teach the use of core degrading fluid. However, JP '220 teaches the use of nozzles N for supplying heated fluid including air and gaseous oxygen into core and effectively burning the core sand and removing the core sand from the casting. It would have been obvious to one having ordinary skill in the art to provide

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Crafton (US 5,439,045) in view of Kawai et al the use of core degrading fluid as taught by JP '220 in order to reduce core heating time and enhance the mechanical property of castings.

10. Claims 74-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crafton (US 5,439,045) in view of Kawai et al and further in view of JP 08132220 and Crafton et al (US Pat. No. 5,294,094 and ~~55~~5,046).

Crafton (US 5,439,045) in view of Kawai et al and further in view of JP 08132220 fails to teach the use of a pressurized oxygen chamber in claim 74 and fail to teach the use of induction energy heat source in claim 75. However, Craft et al (US '094) (col. 15, lines 23+) teach the use of induction energy heat source (electric heaters) for the purpose of effectively heat treating the casting. Further, Craft et al (US '046) (col. 13, lines 15+) teach the use of a pressurized oxygen chamber for the purpose of combusting the binder material associated with the mold sand and core sand. It would have been obvious to one having ordinary skill in the art to provide Crafton (US 5,439,045) in view of Kawai et al and further in view of JP 08132220 the use of induction energy heat source and the use of a pressurized oxygen chamber as taught by Craft et al in order to effectively heat treat the casting and removing the binder.

Response to Arguments

12. Applicant's arguments with respect to claims 67-80, 82-83 and 103-104 have been considered but are moot in view of the new ground(s) of rejection.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.H.L.

I.-H. Lin

4-10-06

KEVIN KERNS
PRIMARY EXAMINER

Kevin Kerns 4/12/06